

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

SYNOPSYS, INC., a Delaware	)	
corporation,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 05-701 (GMS)
	)	
MAGMA DESIGN AUTOMATION,	)	
INC., a Delaware corporation,	)	
	)	
Defendant.	)	

**PLAINTIFF SYNOPSYS, INC.'S  
ANSWERING CLAIM CONSTRUCTION BRIEF**

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## **INTRODUCTION**

Defendant Magma Design Automation, Inc. (“Magma”) has approached the claim construction process in a manner that is inconsistent with Federal Circuit law. The Federal Circuit has long held that where “an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term, ... it is improper to rely on extrinsic evidence.” See Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1581-82 (Fed. Cir. 1996). Yet, Magma asks the Court to dismiss intrinsic evidence that resolves all ambiguity on certain disputed claim terms (e.g., “bin” and “bins”), and rely instead on extrinsic evidence. Magma also ignores express definitions of claim terms in the specifications and instead attempts to create its own constructions rather than rely on what the patents actually say. On other issues, Magma falters on the basic principle that it is improper to read in claim limitations from the description of an embodiment in the specification. Phillips v. AWH Corp., 415 F.3d 1303, 1323 (Fed. Cir. 2005). Finally, many of the issues that Magma attempts to raise are really validity and infringement issues, which are more properly addressed, if at all, during later stages of this proceeding after the claim construction process.

On the other hand, Plaintiff Synopsys, Inc.’s (“Synopsys”) approach to the claim construction process is entirely consistent with Federal Circuit law. Synopsys acknowledges the importance of the intrinsic record and especially of the patent specification itself, which is the single best source of evidence for the meaning of disputed claim terms. See Phillips, 415 F.3d at 1315 (*quoting* Vitronics, 90 F.3d at 1582). Whereas Magma rejects portions of the intrinsic record that do not benefit its position, Synopsys properly considers the entire intrinsic record for each of the patents at issue.



## **ARGUMENT**

### **I. THE ‘508 PATENT.**

Magma complains that nine disputed claim terms in the ‘508 Patent is too many, and that this is “a direct result of Synopsys’s attempt to rewrite that patent to cover what Magma does.” D.I. 145 at 2. This is a gross mischaracterization of how the parties came to have nine terms in dispute. In fact, Magma originally identified *twenty four claim terms* in the ‘508 Patent as needing construction.<sup>1</sup> Contrary to Magma’s assertion, the remaining disputes do not stem from any attempt on the part of Synopsys to “rewrite the patent,” but rather from Magma’s attempt to import extraneous limitations into the claims.

#### **A. Magma’s Inappropriate Infringement And Invalidity Arguments.**

Magma devotes six pages of its Opening Brief to irrelevant issues, including whether or not the claims cover “force directed” and “min-cut” placement algorithms.<sup>2</sup> D.I. 145 at 15-21. These issues are irrelevant to claim construction. First, “min-cut” and “force-directed” placement algorithms are not discussed in the ‘508 Patent. See Reply Declaration Of David Harris, Ph.D., In Support Of Synopsys, Inc.’s Answering Claim Construction Brief (“Harris Reply Decl.”) (attached hereto as attachment A), ¶¶ 13-14. Second, there is no dispute regarding the scope of the “placement” terms recited in the claims of the ‘508 Patent.<sup>3</sup>

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<sup>1</sup> See Exhibit B hereto, Magma’s Proposed Terms And Claim Elements For Construction, dated September 13, 2006.

<sup>2</sup> Magma incorrectly characterizes “min-cut” and “force directed” as “congestion algorithms.” D.I. 145 at 16, 17. These terms both characterize placement algorithms. Harris Reply Decl. ¶¶ 13-23.

<sup>3</sup> Each of the independent claims recite “performing an initial placement.” 1 A-8 - A-9.

**1. Infringement Issues Should Not Be Considered  
During Claim Construction.**

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Given that “force-directed” algorithms are not discussed in the ‘508 Patent, the Court may wonder why Magma devotes so much attention to this topic. While Synopsys has never mentioned “force-directed” algorithms in the context of this lawsuit, Magma states that “Synopsys is trying to stretch a patent that provided an incremental improvement to outmoded technology (the ‘min-cut’ system described below) to fit over modern ‘force directed’ congestion-reduction technology.” D.I. 145 at 15. What Magma is implying is that its own products use “force-directed” algorithms, hence making a backdoor non-infringement argument.

The Court should reject Magma’s invitation to entertain infringement issues at this stage of the proceedings. The Federal Circuit has long held that claims must be construed before infringement analysis is performed. See Vitronics, 90 F.3d at 1581-82. Claim construction is a question of law, while infringement is a question of fact. Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1324 (Fed. Cir. 2002). Furthermore, it is not proper to consider the accused devices during claim construction. See Young Dental Mfg. Co. v. Q3 Special Prods., Inc., 112 F.3d 1137, 1141 (Fed. Cir. 1997) (“the claim scope is determined without regard for the accused device.”).<sup>4</sup>

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<sup>4</sup> See also Takata Corp. v. AlliedSignal Inc., 1999 U.S. Dist. LEXIS 15037 at \*29, n. 15 (Dist. Del. Aug. 19, 1999) (“**The Federal Circuit ... continues to draw a line between claim construction issues and issues of infringement and invalidity.** See Markman v. Westview Instruments, Inc., 52 F.3d 967, 986 (Fed. Cir. 1995) (citations omitted). **The Court will not consider the merits of any such arguments while engaging in claim construction.**”) (emphasis added).

**2. The Validity Issues Magma Raises Are Irrelevant To Claim Construction.**

---

Magma suggests that the ‘508 Patent claims would be invalid if they cover “force-directed” algorithms. D.I. 145 at 15. The Federal Circuit has held that validity should only be considered during claim construction in certain limited circumstances. See, e.g., Phillips, 415 F.3d at 1327. In this situation, issues regarding the placement algorithms are outside the scope of claim construction because the “placement” terms in the ‘508 claims are not even disputed. It should also be noted that issued patents are afforded a presumption of validity, which can only be overcome by clear and convincing evidence. See Schumer v. Lab. Computer Sys., Inc., 308 F.3d 1304, 1315 (Fed. Cir. 2002).

**3. The ‘508 Patent Is Not Aimed At Any Particular Placement Algorithm.**

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In its attempt to raise invalidity issues relating to placement algorithms, Magma refers to the ‘508 Patent as the “min-cut patent.” D.I. 145 at 18. This characterization is a fallacy because the ‘508 Patent is completely agnostic with regard to placement. Not only does the ‘508 Patent not discuss “min-cut” placement algorithms, it teaches that “placement” can be done using virtually any known placement techniques. Harris Reply Decl. ¶¶ 15-20. Indeed, the ‘508 Patent devotes just two sentences to placement techniques. 1 A-7 at 3:31-35.

If the practice of “min-cut” placement algorithms were essential to the claimed invention, the concept would be mentioned somewhere in the patent, but it is not. If a particular placement algorithm were essential, one would not expect a statement in the Specification that “the present invention may be used in conjunction with an electronic design automation placement tool.” 1 A-7 at 3:31-35. This statement conveys that any placement tool may be used. Harris Reply Decl. ¶¶ 18-20. When the ‘508 Patent was filed, those of ordinary skill in the art were well

aware of many different types of placement tools and placement algorithms, including “force-directed” and “min-cut” algorithms. Id.

In its brief, Magma asserts that “force-directed” placement algorithms were first introduced after the filing of the ‘508 Patent. D.I. 145 at 17-18. Magma is very much mistaken in this assertion. Harris Reply Decl. ¶¶ 22-23. In fact, “force-directed” placement algorithms were very well known to those of ordinary skill in the art in the 1980’s. Id. ¶ 23. Magma’s story about “force-directed” placement techniques is contrived, and it should not be considered.

#### **4. The Novelty Of The ‘508 Patent Focuses On “Logic Modifications.”**

The novelty of the ‘508 Patent invention focuses on the use of logic modifications that help placement reduce congestion. Harris Reply Decl. ¶¶ 11-12. While the ‘508 Patent includes just two sentences describing previously known placement tools, it includes almost three columns describing a wide variety of different types of “logic optimizations.” See 1 A-7 – A-8. In fact, nine out of the twelve figures in the ‘508 Patent show logic modifications. Harris Reply Decl. ¶ 12. Accordingly, the novelty of the claimed inventions focuses on logic modifications, and not on any placement algorithm. Id.

#### **B. Construction Of “Bins.”**

Relying on solid intrinsic evidence, Synopsys proposes that “bins” means “one or more regions,” and that a “bin” is simply “a region.” On the other side of the spectrum, Magma dismisses all intrinsic evidence and relies exclusively on extrinsic evidence to conclude that a “bin” is “a rectangular (or square) portion of an integrated circuit bounded by gridlines,” and that the term “bins” means “more than one bin.” D.I. 145 at 23-25. Magma’s approach is inconsistent with Federal Circuit case law. See, e.g., Phillips, 415 F.3d at 1318.

**1. The Intrinsic Record Of The ‘508 Patent Plainly Dictates That “Bins” Means “One Or More Regions.”**

The patentees clearly defined “bins” to mean “one or more regions.” 1 A-8 at 6:46-49. This definition appears in the claim preambles, which recite “one or more regions called bins.” 1 A-8 - A-9 (emphasis added). In its Opening Brief, Magma simply dismisses this intrinsic evidence. D.I. 145 at 21-24. The words of the claim are supposed to be the starting point for claim construction. See Vitronics, 90 F.3d at 1582. Yet, Magma dismisses the definition of “bins” in the claim preambles, with the following statement:

Because bins were such an elemental part of the then-popular min-cut system, the ‘508 inventors felt no need to define the term. Extrinsic evidence is thus appropriate.

D.I. 145 at 21.

The above statement is completely disconnected from the facts of the present case. First, the ‘508 Patent does not mention a “min-cut system.” Also the statement that the inventors “felt no need to define the term” is false because the inventors included the definition of “one or more regions called bins” in the claims. The file history explains that this language was included to “account for the **possibility of performing the present invention using only a single bin (i.e., one encompassing the entire integrated circuit) as opposed to multiple bins.**” 24 A-445 (emphasis added). Given the clarity of this intrinsic evidence, the Court should conclude that Magma’s exclusive reliance on extrinsic evidence is not appropriate. 24 A-442 – A-445.

**2. The Amendment Did Not Introduce New Matter.**

Magma argues that the language “one or more regions called bins” constitutes “new matter.” D.I. 145 at 20. What Magma *appears* to be arguing is that the Court should

disregard the claim language because the Specification allegedly does not provide support under 35 U.S.C. § 112 for use of the invention with only one bin. Id. This is another invalidity issue, which must be subject to the clear and convincing standard. Schumer, 308 F.3d at 1315. Regardless, Magma is incorrect that the claims would be invalid if “bins” means “one ore more regions.”

**a. The Examiner’s Allowance Of The Amended Claims Creates A Presumption That The Claims Do Not Contain New Matter.**

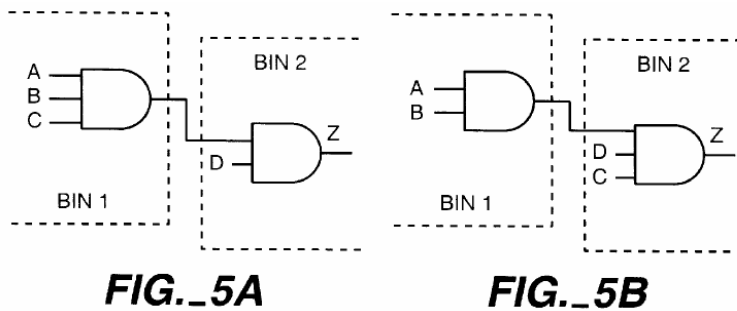
As mentioned, the patentees amended the claims to recite “one or more regions called bins.” 2 A-11 – A-14. The addition of this language was not new matter. The most direct evidence of this fact is that the PTO examiner allowed the claims.<sup>5</sup> The language was added by an Amendment after Allowance, as provided for by 37 C.F.R. § 1.312. Had the Examiner regarded this added language as new matter, the Examiner would have rejected the claims. See Manual of Patent Examining Procedure (“MPEP”) § 2163.06(I) (stating that “[i]f new matter is added to the claims, the examiner should reject the claims under 35 U.S.C. 112, first paragraph - written description requirement); In re Rasmussen, 650 F.2d 1212, 211 U.S.P.Q. 323 (C.C.P.A. 1981).”) Because the Examiner did not reject the amended claims under 35 U.S.C. 112, it must be presumed that the Examiner did not view this amended claim as adding any new matter. See Ultra-Tex Surfaces, Inc. v. Hill Bros. Chem. Co., 204 F.3d 1360, 1367 (Fed. Cir. 2000) (stating that the PTO is “a qualified government agency presumed to have properly done its job” employing examiners “whose duty it is to issue only valid patents”).

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<sup>5</sup> The Examiner stated that “[t]he amendment filed 4/18/2000 under 37 C.F.R. 1.312 has been considered, and has been: entered.” 3 A-16.

**b. The Disclosure Of “Intra-Bin Logic Modifications” Conveys That The Inventions May Be Practiced Using A Single Bin.**

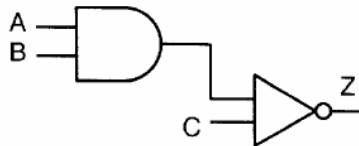
The ‘508 Patent Specification clearly conveys to a person of ordinary skill in the art that the invention may be practiced using one or more bins (*i.e.*, one or more regions) because it teaches the use of both “intra-bin” and “inter-bin” logic modifications. 1 A-4, A-8 at 5:1-25; see also Harris Reply Decl. ¶¶ 28-29. By definition, “intra-bin” logic modifications are performed on a single bin, while “inter-bin” logic modifications are performed across multiple bins.<sup>6</sup> Figures 5A-5B of the ‘508 Patent, reproduced below, show an example of an “inter-bin” logic modification, which is performed across two bins (shown as dashed lines).



See 1 A-4.

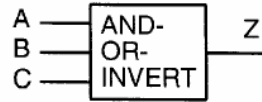
Figures 4A -4B of the ‘508 Patent, reproduced below, show an example of an “intra-bin” logic modification, which is performed in one bin. 1 A-4. The Specification states that “*intra-bin* pin density logic optimization is done by **replacing a set of gates in a bin with a different but logically equivalent set.**” 1 A-8 at 5:1-3 (emphasis added).

<sup>6</sup> “**inter-**. Indicates: 1. Between or among[.]” *The American Heritage Dictionary of the English Language*, p. 683 (William Morris, ed., Houghton Mifflin Co. 1981). “**intra-**. Indicates in, within, or inside of[.]” Exhibit C, attached hereto.



BOTH GATES ARE  
IN THE SAME BIN

**FIG. 4A**



**FIG. 4B**

See 1 A-4.

Because the Specification describes modifications performed within a single bin (“intra-bin” modifications) as well as modifications performed across multiple bins (“inter-bin” modifications), it is clear the invention may be performed using either one or more bins (*i.e.*, one or more regions). Therefore, the Specification clearly conveys to a person of ordinary skill in the art that the invention may be practiced using “one or more regions called bins.”

**c. The Disclosed Methods For Calculating Congestion Allow For Using The Invention With One Or More Bins.**

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Magma also suggests that “bins” must mean “more than one bin” based on an underlying argument that the ‘508 Patent discloses only one method for calculating congestion, and that this single method is allegedly only consistent with using multiple bins. D.I. 145 at 24. This argument is based on a faulty premise because the ‘508 Patent discloses at least two methods for calculating congestion. Harris Reply Decl. ¶ 30. The method that Magma ignores is the one based on “interconnection models” (see 1 A-7 at 3:35-38), and this method is perfectly consistent with using the invention with a single bin encompassing the entire integrated circuit. Id. Therefore, the Specification of the ‘508 Patent is consistent with Synopsys’ proposed construction of “bins” as meaning “one or more regions.”



**d. The ‘508 Patent Is Agnostic On Placement.**

Magma also contends that “bins” must mean “more than one bin,” based on an underlying argument that the ‘508 Patent only discloses placement algorithms that use multiple bins. D.I. 145 at 24. This argument is severely flawed because the ‘508 Patent teaches that virtually any type of placement algorithm may be used with the claimed invention. Harris Reply Decl. ¶¶ 15-20 (stating that “the ‘508 Patent is completely agnostic with regard to placement algorithms.”) Indeed, none of the claims of the ‘508 Patent specify how the “placement” steps must be performed. The ‘508 Patent supports the broadly claimed “placement” steps where it states:

The present invention may be used in conjunction with an electronic design automation [EDA] placement tool. In accordance with an exemplary embodiment of one such placement tool, at each stage in cell placement, the cells are partitioned into a number of bins.

1 A-7 at 3:31-32. The first sentence in the above passage establishes that the invention may be used with any type of EDA placement tool. Harris Reply Decl. ¶¶ 18-19. The second sentence describes an “exemplary embodiment” wherein “the cells are partitioned into a number of bins.” Id. At the time of filing of the ‘508 Patent, it was well-known to those of ordinary skill in the art that some EDA placement tools and methods facilitate placement of cells by partitioning the chip into multiple bins, while others do not. Harris Reply Decl. ¶¶ 18-20. As mentioned above, at the time of filing of the ‘508 Patent, those of ordinary skill in the art were well aware of many different types of placement tools and placement algorithms, including “force-directed” and “min-cut” algorithms. Harris Reply Decl. ¶¶ 19-20. As explained above, Magma’s assertion that “force-directed” placement algorithms were first introduced after the filing of the ‘508 Patent is false. D.I. 145 at 17-18.

To summarize, the '508 Patent contemplates that the invention may be practiced with any generic placement tool or technique. The Specification states that the invention may be used with any EDA placement tool. At the time of filing of the '508 Patent, those of ordinary skill in the art were familiar with many different types of EDA tools and techniques for performing placement using either one or more bins (*i.e.*, one or more regions). Therefore, the Specification of the '508 Patent clearly supports Synopsys' proposed construction of "bins" as meaning "one or more regions."

**3. There Is No Ambiguity In The Patentees' Definition Of "Bins," And Therefore Magma's Invalidity Argument Should Not Be Considered.**

Even though the intrinsic record of the '508 Patent clearly indicates that "bins" was defined to mean "one or more regions" (1 A-8 - A-9; 2 A 11 - A 14), Magma suggests that this term may not be construed in this intended manner because to do so would allegedly render the claims invalid. D.I. 145 at 20. However, it is not appropriate to consider validity issues in the present situation. The Federal Circuit has long held that validity should only be considered when "after applying all the available tools of claim construction . . . the claim is still ambiguous." Phillips, 415 F.3d at 1327. The Federal Circuit more recently stated that where other claim construction tools unambiguously resolve the claim construction dispute, considering validity would be improper. Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc., 424 F.3d 1293 (Fed. Cir. 2005) (*citing Phillips*, 415 F.3d at 1327 (citations omitted)).

The intrinsic record of the '508 Patent clearly indicates that "bins" was defined to mean "one or more regions." 1 A-8 - A-9; 2 A 11 - A 14. This evidence unambiguously resolves the dispute regarding the proper construction of the term "bins." Thus, it would be improper to consider Magma's invalidity arguments at this stage. Those arguments should be

addressed, if at all, during later stages of this proceeding under the clear and convincing standard. See Schumer, 308 F.3d at 1315. Therefore, the Court should adopt Synopsys' proposed construction of "bins" as meaning "one or more regions."

**4. Contrary To Magma's Assertions, Synopsys' Construction Of "Bins" Does Not Exclude The Plural.**

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Magma accuses Synopsys of attempting to "read out the plural" from the term "bins." D.I. 145 at 25. This is a mischaracterization because Synopsys' proposed construction – "one or more regions" – includes both the singular and the plural. Magma cites Leggett & Platt, Inc. v. Hickory Springs Mfg. Co., 285 F.3d 1353, 1357 (Fed. Cir. 2002), to support its assertion that a plural term must be limited to "more than one." Id. at 24. But this case stands for just the opposite. In Leggett & Platt, the court held that the claim term "support wires" covered a *single* strand of wire. Id. at 1358 ("In sum, the district court correctly construed the term 'support wires' to mean 'a continuous strand of wire' with 'only two ends.'").

Courts do not always construe the plural to mean multiple. For example, in Interactive Gift Express, Inc. v. Compuserve, Inc., the Federal Circuit construed a plural term to include the singular. 256 F.3d 1323, 1334 (Fed. Cir. 2001) (determining that the claim language "a plurality of blank material objects" includes "one material object"). Additionally, the Court of Federal Claims has held that the phrase "a form set" can include one sheet and does not require more. See Paymaster Techs., Inc. v. United States, 54 Fed. Cl. 579, 585 (Fed. Cl. 2002) ("[a]lthough the court agrees with defendant's proffered definition of 'set' as that which connotes 'more than one thing of the same kind,' the court holds that the patentee has redefined that term in the given claim."). In the '508 Patent, the Applicants defined "bins" to mean "one or more

regions.” The Applicants’ lexicography therefore governs construction of this term. See Phillips, 415 F.3d at 1315.

**C. Construction Of “Bin.”**

Relying on the patentees’ clear definition of “bins” as meaning “one or more regions,” Synopsys proposes that a “bin” is “a region.” Id. As already explained, Magma dismisses this intrinsic evidence and relies exclusively on extrinsic evidence to conclude that a “bin” is “a rectangular (or square) portion of an integrated circuit bounded by gridlines.” Id.

**1. Magma’s Improperly Dismisses The Intrinsic Evidence.**

Magma cannot dispute that the patentees’ definition of “bins” leaves no ambiguity regarding the construction of the terms “bin” and “bins.” Given the clarity of this intrinsic evidence, it is improper to turn to extrinsic evidence. See Vitronics, 90 F.3d at 1583 (where “an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term . . . , it is improper to rely on extrinsic evidence”). Both the claims and prosecution history clearly and unambiguously dictate that the invention may be practiced on “one or more regions called bins.” Therefore, it is improper to resort to extrinsic evidence.

**2. The Extrinsic Evidence Magma Relies On For Its Proposed Construction Of “Bin” Is Inconsistent With The ‘508 Patent.**

Even were it appropriate to examine extrinsic evidence, a person of ordinary skill in the art would not understand “bin” to be limited to “a rectangular (or square) portion of an integrated circuit bounded by gridlines.” Harris Reply Decl. ¶¶ 37-39. In addition, the evidence Magma proffers would not support Magma’s proposed construction of a “bin.” Magma cites a number of articles and patents to support its proposed construction of “bin.” D.I. 145 at 21-22.

For example, Magma cites the ‘743 Patent, which is unrelated to the ‘508 Patent.<sup>7</sup> Although the ‘743 Patent uses the term “bins,” the context is very different from the context of the ‘508 Patent. There is a fundamental difference between the methodology described in the two patents because the ‘743 Patent describes a “recursive quadrisection” process in which each bin is divided into four bins. 27 A-490 at 2:40-42. The ‘508 Patent does not require, or even mention, a quadrisection process. The Federal Circuit has stated that “extrinsic evidence ... is unlikely to result in a reliable interpretation of patent claim scope unless it is considered in the context of the intrinsic evidence.” Phillips, 415 F.3d at 1319.

In the present case, the term “bin” is not used in the same context in the ‘508 and ‘743 Patents. Therefore, the ‘743 Patent is not reliable evidence concerning the scope of the claim term “bin” in the ‘508 Patent. The same problem – inconsistency in the contexts of the extrinsic evidence versus the context of the ‘508 patent claims – is inherent in all of the other extrinsic evidence Magma cites in support of its constructions of the terms “bin” and “bins.”

### **3. Magma’s Proposed Construction Of The Term “Bin” Is Inconsistent With The Prosecution History Of The ‘508 Patent.**

Magma has proposed that the term “bin” is limited to “a rectangular (or square) portion of an integrated circuit bounded by gridlines.” D.I. 145 at 21. The limitation that a “bin” must be a “**portion of an integrated circuit**” would mean that a “bin” cannot encompass the entire integrated circuit. This limitation is inconsistent with the patentees’ statements that the issued claims “account for the possibility of **performing the present invention using only a**

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<sup>7</sup> The ‘743 and ‘508 Patents do not share the same inventive entity. See In re Kaplan, 789 F.2d 1574, 1575 (Fed. Cir. 1986). Therefore, contrary to Magma’s assertions, the ‘743 and ‘508 Patents cannot be considered as having the same inventors.

**single bin** (*i.e.* **one encompassing the entire integrated circuit**) as opposed to multiple bins.” 24 A-445 (emphasis added). Magma’s proposed construction of “bin” should be rejected because it directly contradicts the file history of the ‘508 Patent.

To summarize, the Court should reject Magma’s proposed construction of “bin” because it is improperly derived from extrinsic evidence that it is directly inconsistent with the intrinsic evidence defining “bins” as “one or more regions.” 24 A-442 – A-445. The Court should adopt Synopsys’ construction of “bin” as meaning “a region” because this construction is dictated by the intrinsic evidence.

#### **D. Construction Of “Selected Bins.”**

Consistent with the patentees’ definition of “bins” as “one or more regions,” Synopsys proposes that “selected bins” simply means “one or more selected regions.” Again seeking to import limitations from the specification, Magma proposes that “selected bins” means “more than one bin selected based on congestion.” D.I. 145 at 25 (emphasis added). The Court should resolve the singular-versus-plural dispute on this term in Synopsys’ favor under the same reasoning applied to the term “bins.” Beyond that issue, Magma also attempts to limit the word “selected” to mean “selected **based on congestion.**” *Id.* Here Magma is attempting to import a limitation from the specification into the claims by requiring not just that bins be “selected,” as the claim plainly states, but that the bins must be selected based on a specific criteria – “based on congestion.”

The limitation “selected based on congestion” is extraneous because it is not present in the plain and ordinary meaning of the claim term. Magma arbitrarily imports this limitation from one of the embodiments in the Specification. D.I. 145 at 25; 1 A-7 at 3:53-56 and 4:54-55. But as Magma itself notes, it is “improper to import limitations from the

specification into the claims, or to limit construction of a term to the preferred embodiment.” D.I. 145 at 12 (*citing Phillips*, 415 F.3d at 1323).

None of the claims of the ‘508 Patent specify any particular criteria upon which the bins must be “selected.” There are many different possible criteria for selecting a bin for purposes of “performing logic modifications.” Harris Reply Decl. ¶¶ 32-33. For example, a “bin” may be selected based on timing, density, power consumption, or congestion. *Id.* The Specification explicitly calls out “identification of critical paths and/or congested circuits” as two possible criteria for selecting regions of the chip to be subjected to logic modifications. *Id.* ¶ 33 (*citing* 1 A-7 at 3:61). There is no justification in the Specification for limiting the term “selected bins” to a selection “based on congestion” as Magma has proposed. Therefore, the Court should adopt Synopsys’ proposed construction, in which “selected bins” simply means “one or more selected regions.”

#### **E. Construction Of “Limits.”**

Synopsys has proposed that “limits” means “upper bounds.” In its quest to avoid infringement, Magma has proposed that “limits” necessarily must have a plural connotation, and that it therefore means “more than one upper bound.” D.I. 145 at 30. The fundamental problem with Magma’s proposed construction of “limits” is that it improperly requires a plurality of upper bounds. As explained below, Magma’s proposed construction should be rejected because it is inconsistent with the context of the claims, inconsistent with plain meaning, and because it does not cover the preferred embodiment described in the Specification of the ‘508 Patent.

In its Opening Brief, Magma offers just one paragraph on the meaning of the term “limits,” and the sum total of the substantive analysis is that limits means “more than one upper bound” because the word “limits” ends in an “s.” D.I. 145 at 30. The short shrift Magma gives

to this term is a transparent attempt to convince the Court not to look past the fact that the word “limits” ends in an “s.” Magma fails to consider that in the English language, some words that end in “s” are not necessarily plural. Magma also ignores Federal Circuit precedent in failing to consider the context of the surrounding words of the claims, in which the “limits” refer to a single boundary on a two-dimensional “area.” Phillips, 415 F.3d at 1314. Finally, Magma conveniently ignores the Specification of the ‘508 Patent, which is the single best source of evidence for the meaning of the disputed claim term “limits.” See id. at 1315 (*quoting Vitronics*, 90 F.3d at 1582).

**1. Synopsys’ Proposed Construction Of “Limits” Is Consistent With The Plain Meaning As Well As The Context Of The Claim Language.**

The term “limits” appears in the claims in the phrase “subject to limits on the increase in area of integrated circuit elements within a bin ....” 1 A-9 at 8:54-58. Support for this claim language is found in the Specification of the ‘508 Patent as follows:

Monitoring of the area used in order to preserve the feasibility of the placement is done by **placing an upper bound on the area of each bin.** The proposed logic optimizations are only allowed to increase the bin area to the upper bound.

1 A-8 at 5:58-6:2 (emphasis added).

The context of the claim in which the term appears provides substantial guidance as to the meaning of the term. See, e.g., Phillips, 415 F.3d at 1317 (*citing Vitronics*, 90 F.3d at 1582). In the context of the above claims, the term “limits” relates to an “increase in area.” Of course, an “area” is two-dimensional in nature. In plain and ordinary English, the term “*limits*” is commonly used to characterize one boundary surrounding an area. 5 A-26 (The American Heritage Dictionary of the English Language, p. 758) (“limit ... *Usually plural.* The boundary



surrounding a specific area; bounds; within the city limits.”). For example, the phrase “city limits” is commonly used to define a single boundary surrounding the area of a city. Id.

Synopsys’ proposed construction of “limits” – as meaning “upper bounds” – includes the concept of a single boundary on the “increase in **area** of integrated circuit elements within a bin.” Magma’s proposed construction of “limits” – as “more than one upper bound” – is misleading because it would require that more than one boundary be placed on the “increase in area of integrated circuit elements within a bin.” As explained below, Magma’s interpretation of “limits” is not supported by the Specification of the ‘508 Patent.

**2. Synopsys’ Proposed Construction Of “Limits” Is Consistent With The Specification Of The ‘508 Patent, Whereas Magma’s Construction Contradicts The Specification.**

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Magma’s proposed construction of “limits” as meaning “more than one upper bound” does not cover the preferred embodiment in which one upper bound is described as being placed on the area of each bin (*i.e.*, region). “A claim construction that excludes a preferred embodiment is ‘rarely, if ever, correct.’” SanDisk Corp. v. Memorex Prods., Inc., 415 F.3d 1278, 1285 (Fed. Cir. 2005) (*quoting Vitronics*, 90 F.3d at 1583). Therefore, Magma’s proposed construction of “limits” should be firmly rejected. Instead, the Court should adopt Synopsys’ proposed construction of “limits” (*i.e.*, “upper bounds”) because Synopsys’ proposed construction covers the preferred embodiment of the ‘508 Patent.

**F. Construction Of The “Improving Congestion” Terms.**

Two of the disputed claim terms involve “improving congestion.” The opposing constructions for these terms (hereinafter referred to as the “Improving Congestion Terms”) are summarized below.

<b>‘508 Claim Language</b>	<b>Synopsys’ Proposed Construction</b>	<b>Magma’s Proposed Construction</b>
<b>to allow congestion of the placement to be improved</b> (Claims 1-11, 15, 17)	to provide opportunities for placement to improve congestion. (AJCC, Exh. B, p. 13)	<i>with the purpose of reducing congestion</i> of the placement. (AJCC, Exh. B, p. 13) (emphasis Added).
<b>in an attempt to improve congestion by taking advantage of the logic modifications</b> (Claims 2-11, 13, 14)	to relieve congestion where opportunities are provided by logic modifications. (AJCC, Exh. B, p. 3.)	<i>with the purpose of reducing congestion</i> by taking advantage of more than one logic modification. (AJCC, Exh. B, p. 3) (Emphasis Added).

Both parties’ constructions of these terms involve improving (or reducing) “congestion.” However, Magma’s proposed constructions injects the extraneous limitation of a “purpose of reducing congestion” into these two claim terms, while Synopsys’ proposed constructions recognize the effect of reducing congestion. The distinction between “purpose” and “effect” is not insignificant. Harris Reply Decl. ¶¶ 43-48.

A computer program does not perform steps with intent or purpose. Harris Reply Decl. ¶ 45. It only has an effect or result. Id. It is apparent that Magma seeks to inject a “purpose” limitation into the Improving Congestion Terms because Magma knows it would be difficult to prove that a computer program carries out a series of steps for any particular “purpose.” Id.

The Improving Congestion Terms appear in the context of the claims of the ‘508 Patent as follows:

- “subject to limits on the increase in area of integrated circuit elements within a bin, performing logic modifications within selected bins of the integrated circuit design to allow congestion of the placement to be improved” (1 A-8 at 6:53-57) (claim 1); and
- “performing placement refinement in an attempt to improve congestion by taking advantage of the logic modifications” (1 A-8 at 59-61) (claim 2).

1 A-8 - A-9 (emphasis added on disputed language).

Magma cites the following portions of the Specification of the ‘508 Patent, which actually teach that the effect of doing “logic modifications” and “placement refinement” may be to relieve congestion:

- This invention recognizes the **ability of logic optimizations to help placement relieve congestion**. (1A-6 at 2:21-22 (emphasis added)).
- This invention will significantly reduce, if not eliminate, the iterations needed by considering not only the impact of interconnect during logic optimization of area/timing, but also at the same time **doing logic optimizations to help placement relieve congestion** and thus generate a circuit that is easily routable. (1 A-8 at 6:30-35 (emphasis added)).
- Rather, the approach of the present invention is to first reduce signal delays using conventional logic optimization techniques. This reduction in the signal delays provides additional **slack that can then be used** by a subsequent placement step **to relieve congestion**. (24 A-427 (emphasis added)).
- In the present invention, **congestion is addressed through logic modification**. (Id. at A-426 (emphasis added)).

Contrary to Magma’s assertions, the above passages do not suggest that logic modification or placement steps must be performed with a “**purpose**” or intent to relieve congestion. Harris Reply Decl. ¶¶ 43-48. While the above passages draw connections between “logic modification,” “placement,” and “reliev[ing] congestion,” these connections are more properly characterized as potential effects (*i.e.*, logic modifications and placement refinement may have the effect of relieving congestion), rather than “purposes.” The above passages of the ‘508 Patent mention the “**ability**” of certain steps to “**help**” in relieving congestion, and also mention that congestion is “**addressed**” through logic modifications. Synopsys does not deny that the Improving Congestion Terms do indeed require an *effect* of reducing congestion. However, Magma’s injection of a “purpose” into these claim terms is not warranted.

Magma also argues that the “invention’s **goal** is to reduce congestion.” D.I. 145 at 28. Synopsys does not dispute that the “goal” of the inventions claimed in the ‘508 Patent is

to reduce congestion. However, this does not mean that the steps of “performing logic modifications” and “performing placement refinement” must be done “with the purpose of reducing congestion.”

Magma’s proposed constructions of the Improving Congestion Terms improperly read a limitation into the claims (*i.e.*, “with the purpose of reducing congestion”). The Federal Circuit has consistently warned against this approach to claim construction. See Arlington Indus., Inc. v. Bridgeport Fittings, Inc., 345 F.3d 1318, 1327 (Fed. Cir. 2003) (*citing Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1325 (Fed. Cir. 2003) (“courts must take extreme care when ascertaining the proper scope of the claims, lest they simultaneously import into the claims limitations that were unintended by the patentee.”)). The Federal Circuit has also stated that “[a]dvantages described in the body of the specification, if not included in the claims, are not per se limitations to the claimed invention.” Vehicular Techs. Corp. v. Titan Wheel Int’l., Inc., 141 F.3d 1084, 1096 (Fed. Cir. 1998) (*citing Applied Materials, Inc. v. Advanced Semiconductor Materials. Am., Inc.*, 98 F.3d 1563, 1574 (Fed. Cir. 1996) (only when the inventor’s purpose is included in the claims does the purpose serve as “a limitation of the claimed invention [that] should be met either literally or equivalently in order to satisfy the criteria of infringement”)).

For all of the reasons explained above, the Court should adopt Synopsys’ proposed constructions of the Improving Congestion Terms, and thereby reject Magma’s improper attempt to read a “purpose” limitation into these claim terms.

**G. “Reducing Constraints On A Subsequent Placement Step.”**

Another disputed claim term recites “reducing constraints on a subsequent placement step.” The parties’ opposing constructions for this claim term are presented below.

'508 Claim Language	Synopsis' Proposed Construction	Magma's Proposed Construction
<b>reducing constraints on a subsequent placement step</b> (Claims 12-14, 16, 18)	reducing more than one constraint on a subsequent placement step.	reducing more than one constraint on a subsequent placement step <i>with the purpose of reducing congestion</i> during the subsequent placement step.

In its Opening Brief, Magma improperly combines its analysis of the claim term “reducing constraints on a subsequent placement step” with the two Improving Congestion Terms discussed above. D.I. 145 at 26-27. Just as it does with the Improving Congestion Terms, Magma interprets this phrase to require the limitation “with the purpose of reducing congestion.”<sup>8</sup> However, unlike the two Improving Congestion Terms, the claim language “reducing constraints on a subsequent placement step” does not even mention the word “congestion.” Therefore, it is even more improper to read the limitation “with the purpose of reducing congestion” into this disputed term because “congestion” is not even mentioned in the claim language.

To support its proposed construction of “reducing constraints on a subsequent placement step,” Magma cites to a number of passages in the Specification that discuss “congestion.” D.I. 145 at 28. However, the phrase “reducing constraints on a subsequent placement step” does not implicate congestion. The “constraints” referred to in the phrase “reducing constraints on a subsequent placement step” may also be timing constraints. Harris Reply Decl. ¶¶ 49-54. The ‘508 Patent specification explains that “such timing improvement is desirable in and of itself.” 1 A-7 at 4:2-3.

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<sup>8</sup> Synopsis has amended its construction of “reducing constraints on a subsequent placement step” to mean “reducing more than one constraint on a subsequent placement step.” Synopsis originally proposed that this term means “reducing one or more constraints on a subsequent placement step.” Upon further consideration, Synopsis concedes that in this context, “constraints” suggests “more than one constraint.”

Because the phrase “reducing constraints on a subsequent placement step” does not implicate “congestion,” and because it is improper to read a “purpose” limitation into this claim term, the Court should reject Magma’s proposed construction. Instead, the Court should adopt Synopsys’ proposed construction, in which “reducing constraints on a subsequent placement step” simply means “reducing more than one constraint on a subsequent placement step.”

#### **H. Means-Plus-Function Claims.**

Magma states that: “The parties agree that claims 17 and 18 are means-plus-function claims. The parties disagree about how the claim terms define the function.” D.I. 145 at 30. The second part of this statement is puzzling because there is no indication that the parties dispute the claimed functions for the means-plus-function terms. See Amended Final Joint Claim Chart (“AJCC”), D.I. 140, Exh. B at 7-11; and D.I. 145 at 32-33. The only dispute lies in the structures disclosed in the ‘508 patent specification that perform the claimed functions. AJCC, Exh. B at 7-11.

##### **1. “Means For Calculating Congestion Of The Of The Initial Placement”**

To perform the claimed function of “calculating congestion of the initial placement,” the ‘508 Patent discloses the following structures:

- a computer executing an algorithm for calculating congestion for the initial placement using interconnection models for interconnects between bins or within bins (1 A-7 at 3:35-38); and
- a computer executing an algorithm for calculating congestion for the initial placement in accordance with an algorithm that calculates the total number of pins in the bin divided by the total routable area in the bin (1 A-7 at 4:61-67).

Harris Reply Decl. ¶¶ 55, 57, 59; AJCC, Exh. B at 7-8.

Magma agrees that the second algorithm listed above corresponds with the claimed function of “calculating congestion of the initial placement.” D.I. 145 at 32. Magma incorrectly asserts, however, that the ‘508 patent does not disclose the first algorithm. Id.; Harris Reply Decl. ¶¶ 55-60.

A person of ordinary skill in the art at the time of the invention would recognize that the ‘508 Patent discloses the first algorithm, which Dr. Harris conveniently refers to as the Interconnect Model Algorithm. Harris Reply Decl. ¶¶ 56-60. The Interconnect Model Algorithm was known to those skilled in the art as a way to calculate congestion. Harris Reply Decl. ¶ 59. The ‘508 patent clearly links the Interconnect Model Algorithm to the claimed function (id. at ¶ 57):

Interconnection models for interconnects between bins and within bins provide both delay estimates for each interconnect in the circuit, as well as congestion estimates for each bin in the circuit. (1 A-7 at 3:35-38).

A person of ordinary skill in the art at the time of the invention would recognize that this language from the specification identifies the Interconnect Model Algorithm as a method for calculating congestion of the initial placement. Harris Reply Decl. ¶ 57. Likewise, the ‘508 patent specification explicitly states, and one of ordinary skill in the art would recognize, that the invention can be embodied in a computer that implements these methods. 1 A-7 at 6:3-11; Harris Reply Decl. ¶ 59.

Therefore, the structure corresponding with the “means for calculating congestion of the initial placement” includes both: (1) a computer executing an algorithm for calculating congestion for the initial placement using interconnection models for interconnects between bins or within bins; and (2) a computer executing an algorithm for calculating congestion for the

initial placement in accordance with an algorithm that calculates the total number of pins in the bin divided by the total routable area in the bin. Harris Reply Decl. ¶¶ 55, 57, 59.

**2. “Means For Performing An Initial Placement Of Integrated Circuit Elements Within Bins On The Design Layout”**

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Magma asserts that the ‘508 Patent does not disclose any structure at all for performing the claimed function of “performing an initial placement of integrated circuit elements within bins on the design layout.” D.I. 145 at 33-34. Not only is Magma incorrect in this assertion (Harris Reply Decl. ¶ 62), but Magma is again attempting to improperly turn the claim construction process into a validity argument. By saying that there is no corresponding structure for the claim term, Magma is arguing that the ‘508 patent does not satisfy the written description requirement of 35 U.S.C. § 112, ¶ 1 for claims 17 and 18. As previously discussed, invalidity arguments are improper during the claim construction process. See Takata Corp., 1999 U.S. LEXIS 15037 at \*29. If made at the appropriate time, Magma would have to attempt to prove these invalidity allegations by clear and convincing evidence. See Schumer, 308 F.3d at 1315. Having taken the position that claims 17 and 18 are invalid, Magma does not provide any identification of the corresponding structures. D.I. 145 at 33-34; AJCC, Exh. B at 8-11.

The ‘508 patent identifies the following structures for “performing an initial placement of integrated circuit elements within bins on the design layout”:

- an electronic design automation (“EDA”) tool (1 A-7 at 3:30-31);
- a computer executing an algorithm for placing cells in one or more regions using a placement tool that partitions cells into one or more regions at each stage of the placement (1 A-7 at 3:31-35); and
- a computer executing an algorithm for placing cells in accordance with a placement algorithm that is limited by the topology of the circuit (1 A-7 4:23-29).

Harris Reply Decl. ¶ 61; AJCC, Exh. B at 8-11.



Support for these structures is found in the following portions of the '508 specification, respectively:

- The present invention may be used in conjunction with an electronic design automation placement tool. (1 A-7 at 3:30-31);
- The present invention may be used in conjunction with an electronic design automation placement tool. In accordance with the exemplary embodiment of one such placement tool, at each stage in cell placement, the cells are partitioned into a number of bins. (1 A-7 at 3:31-35); and
- Placement algorithms are limited in how they can place cells by the topology of the circuit. If the output of cell A is connected to (also referred to as “fanning out to”) four different terminals in different cells (indicated by the numbers 1-4) in FIG. 3(a), then the placement of A is strongly influenced by the placement of cells corresponding to these terminals. (1 A-7 at 4:23-29).

Harris Reply Decl. ¶¶ 61-62.

Based on the above language, a person of ordinary skill in the art at the time of the invention would understand that the claimed function may be performed using any EDA placement tool. Harris Reply Decl. ¶ 63. Likewise, one of ordinary skill in the art would understand that the '508 patent specification is describing a class of algorithms for performing the claimed function. Id. at ¶ 64. A person of ordinary skill in the art would understand the exemplary embodiment described by “**at each stage** in cell placement, the cells are partitioned into a number of bins” as describing an iterative partitioning process, which is just one structure for performing the claimed function. 1 A-7 at 3:31-35 (emphasis added); Harris Reply Decl. ¶ 65.

Therefore, the correct construction for the claim term “means for performing an initial placement of integrated circuit elements within bins on the design layout” includes the structures: (1) an electronic design automation (“EDA”) tool; (2) a computer executing an algorithm for placing cells in one or more regions using a placement tool that partitions cells into

one or more regions at each stage of the placement; and (3) a computer executing an algorithm for placing cells in accordance with a placement algorithm that is limited by the topology of the circuit. Harris Reply Decl. ¶¶ 61-65.

## II. THE ‘745 PATENT.

### A. **“Bucket” Is A Defined Term That Includes The Word “Placement”—Magma Cannot Change An Explicitly Defined Term.**

Synopsys proposes that the term “bucket” be interpreted as a “rectangular, coarse placement region within the chip’s core area.” Except for the omission of the word “placement,” Magma’s proposal is almost identical: “a coarse, rectangular region within the chip’s core area.” Magma’s proposed construction is contrary to the express definition of the term in the specification and improperly broadens the scope of the claim term by omitting an express limitation.

In its Opening Brief, Magma incorrectly asserts that the term “bucket” is not defined in the specification. D.I. 145 at 12. In fact, “bucket” is expressly defined as a “coarse placement region[]”:

“[T]he core 400 where the cells are placed is divided into *coarse placement regions called buckets* . . . . Each bucket 410 is a small rectangular region within the core 400.”

8A-66 at 6:47-50 (emphasis added). See, e.g., C.R. Bard, Inc. v. U.S. Surgical Corp., 388 F.3d 858, 865 (Fed. Cir. 2004) (holding that the description in the specification that a plug “includes” and “ha[s] a pleated surface” is an unequivocal and explicit definition of claim term “plug,” which must have a “pleated surface”); see also Astrazeneca AB v. Mut. Pharm. Co., 384 F.3d 1333, 1339 (Fed. Cir. 2004) (a definition does not require “a statement in the form ‘I define \_\_\_\_ to mean \_\_\_\_’”).

Magma wishes to remove the word “placement” from this definition and, by result, improperly broaden this claim term. But “placement” is part of the definition and cannot be left out. Magma’s argument that this express definition is merely a preferred embodiment, and that the word “placement” is optional, is refuted by the plain words of the specification.

This definition is completely consistent with the use of the term elsewhere in the specification, which makes clear throughout the patent that a bucket is a placement region. See, e.g., 8 A-56, A-65 at 4:11-12 (“subdivides the chip area of a chip design *to be placed* and routed into a coarse grid of *buckets*”); id. at 8 A-66 at 6:51 (“the *placeable area* within a *bucket*”); id. at 8 A-67 at 7:8-11 (“The second *placement* is done instead of a single cell-level placement because the first *placement* is done with a coarse grid, i.e., *buckets* containing hundreds of cells. Here, the cells are *placed into their corresponding buckets*.”).<sup>9</sup> Also, as demonstrated in Synopsys’ Opening Claim Construction Brief and in the supporting declaration of David Harris, a definition of “bucket” that includes “placement” is the only definition that is consistent with the meaning and syntax of the text quoted above at 6:47-50 and with Magma’s own pre-litigation use of the term. See D.I. 146 at 26-27; Harris Reply Decl. ¶ 69.

In its Opening Brief, Magma states that “Synopsys wants to argue that buckets may only be formed after placement occurs.” D.I. 145 at 11. On the contrary, Synopsys has not made and is not making any such argument. Synopsys’ position is simple: the definition of the

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<sup>9</sup> See also 8 A-66 at 6:61-7:5 (“Cells . . . are assigned to the buckets. . . . Cells . . . are subdivided using quadratic *placement* . . . . This iteration continues until a desired resolution, e.g., a *bucket* 410 is reached.”); id. at A-68 at 9:46-58 (“[T]he cell *placement* will likely be somewhat unbalanced. This imbalance may take several forms: . . . cell recalculation enlarges the size of some cells 420 so that they do not fit within their *buckets* 410 . . . .”); id. at 10:39-40 (“After a satisfactory *placement* has been found in step 560 [sic, 360], the cell area in individual buckets 410 is balanced to balance routing resource usage and area usage among all *buckets* 410.”).

term “bucket” must include the word “placement” because the express definition in the specification says a bucket is a “coarse placement region.” Synopsys is advocating no limitation other than what Magma chose to impose on this term when it prosecuted the application.

**The Examiner’s Notice of Allowability provides no support for Magma’s construction, but in fact supports that of Synopsys. The Examiner stated that the prior art of record did not teach, *inter alia*, “subdividing the chip area of a circuit design to be *placed* and routed into a coarse grid of *buckets* . . . .” This is further evidence that buckets are used for placement and further supports the defining “bucket” as a “placement region.”**

**B. “Congestion Score” Is An Explicitly Defined Term.**

With respect to the term “congestion score,” Synopsys asks the Court to accept the express definition contained in the specification (“the ratio of routing resources used so far to the total routing resources available”). Magma asks the Court to accept a construction contrived by Magma (“a ratio measure of routing resources”) that is different from and broader than the definition given.

Magma once again argues that an express definition in the specification is not really a definition at all, but instead is merely a preferred embodiment. The Federal Circuit held in Astrazeneca that patent lexicography does not require rigid formalism in the form of “I define \_\_\_\_ to mean \_\_\_\_.” Astrazeneca, , 384 F.3d at 1339. Yet, what the applicant wrote in this instance could hardly have been more explicit:

The congestion score for a bucket *is defined* as the ratio of routing resources used so far to the total routing resources available in the bucket.”

8 A-67 at 8:33-36 (emphasis added). This is not a close call.

There can be no reasonable dispute that these are words of exclusion or restriction, and that they limit the term “congestion score” to its definition. See, e.g., *Astrazeneca*, 384 F.3d at 1339 (statement in the specification that “[t]he solubilizers suitable according the invention *are defined below*” provides a strong signal of lexicography, introduces a definition of the term “solubilizer,” and does not refer to preferred embodiments). In addition to this clear definition, Synopsys demonstrated in its opening brief that this definition of “congestion score” is completely consistent with the rest of the specification and with the ordinary use of the term “congestion.” See Harris Decl. ¶¶ 60-63.

In response to this clear evidence of the meaning of the term, Magma argues that the express definition in the specification is really only a preferred embodiment, and that Magma should be allowed to make up its own definition – one that is broader than the definition contained in the patent – so as to encompass what Magma says is another embodiment. Magma, however, is unable to identify any other embodiment in the specification of the patent. The *only* place Magma asserts it can find what it calls an “alternative embodiment” is in dependent claim 2.

Claim 2, however, is not an “alternative embodiment.” First, as demonstrated in our opening brief, the use of the term “congestion score” in claim 2 is contrary to the definition in the patent and contrary to the use of the term everywhere else in the patent. See Harris Decl. ¶¶ 64-68. Moreover, the term “congestion score” in claim 2 is used in a nonsensical fashion. See Harris Reply Decl. ¶ 71. To use Magma’s analogy, congestion in a circuit is akin to congestion on a highway. A congested highway has many cars. A highway that is not congested has few cars. That is the way “congestion score” is defined in the patent (*i.e.*, when the circuit is carrying many wires, it is congested, and the congestion score is high). Magma, however, admits

that “congestion score” is used in precisely the opposite way in claim 2. To continue with the traffic analogy, to use the word “congestion” as it is used in claim 2 means that a highway without a single car would be considered completely congested. That is not the way “congestion” would be understood or used by anyone in the field. Id.

This strange and inconsistent claim language is not an “alternative embodiment.” Id. The patent specification defines a key term – congestion score – and uses that term consistently throughout. Then that same term is used in a completely different and nonsensical way in one of the dependent claims. Id. Rather than disclosing an “alternative embodiment,” as Magma asserts, the patent drafter has simply drafted a claim that does not comport with what was allegedly invented, most likely because of a drafting error. Id. Claim 2 provides no evidence in favor of ignoring an express definition. On the contrary, this just means that claim 2 is invalid for failure to “particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention” as required by 35 U.S.C. § 112, ¶ 2.<sup>10</sup> See Allen Eng’g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1349 (Fed. Cir. 2002) (claim that contradicted the specification was invalid under § 112, ¶ 2); In re Cohn, 438 F.2d 989 (C.C.P.A. 1971) (inherent inconsistency between claims and specification required rejection of claims under 35 U.S.C. § 112, ¶ 2 on grounds of indefiniteness).<sup>11</sup>

Magma also wrongly asserts that the term “congestion score” must be broader than the explicit definition in the patent because of the doctrine of claim differentiation. But

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<sup>10</sup> Of course, invalidity is not an issue for the Court to decide now. This discussion is merely provided for the Court to understand the context of the claim construction dispute.

<sup>11</sup> Claim 2 is also invalid under 35 U.S.C. § 112, ¶ 1 for failure to meet the written description requirement. The fact that claim 2 was filed with the original application does not avoid invalidity under this section. See, e.g., LizardTech, Inc. v. Earth Res. Mapping, Inc., 424 F.3d 1336, 1346-47 (Fed. Cir. 2005) (holding that an originally filed claim did not provide sufficient support to avoid invalidity under 35 U.S.C. § 112).

claim differentiation is only a guide to claim construction, and the Federal Circuit has made clear that a definition trumps any claim differentiation argument. See O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1582 (Fed. Cir. 1997) (holding that “the doctrine [of claim differentiation] cannot alter a definition that is otherwise clear from the claim language, description, and prosecution history” and that “the description in this case provides a clear meaning for the language of the claim and . . . trumps the doctrine of claim differentiation”).<sup>12</sup>

Finally, Magma argues that the file history somehow supports its definition of the term. It does not. Magma takes its excerpted portion of the file history out of context. In fact, when taken in proper context, the file history supports Synopsys’ proposed construction. The relevant part of the file history is the following statement by the examiner in his notice of allowability:

The following is an examiner’s statement of reasons for allowance: the prior art of record does not teach . . . an estimate of congestion in each bucket is calculated from an estimated amount of routing space available on the bucket and estimated consumption of routing resources (space) by a global router; this congestion score (ratio) is then used to determine the spacing of the wires in the bucket . . . .”

36 A-624.

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<sup>12</sup> Magma’s citation of RF Delaware, Inc. v. Pac. Keystone Techs., Inc., 326 F.3d 1255, 1265 (Fed. Cir. 2003), allegedly for the proposition that the language of a claim trumps the specification is inapposite and uses a quotation from the case completely out of context. See D.I. 145 at 14. The *RF Delaware* decision stands for the uncontroversial proposition that it is improper to read limitations from the preferred embodiment into the claims. That is all the Court meant when it said that “courts may not use the teaching of the specification to contradict the clear language of the claims. To require the filter media of claim 1 to be multi-layered would impermissibly read limitations from the specification into the claim.” Id. at 1265. This is completely irrelevant to what is at issue regarding “congestion score,” where there is an express definition of a term in the specification.

By quoting only a short phrase from this passage (“this congestion score (ratio) is then used to determine the spacing of the wires”), Magma argues that the examiner is attempting to define “congestion score” as a “ratio.” As an initial matter, the examiner does not appear to be defining anything in this passage. To the extent that anything in it can be used to support a definition, however, it is clear that the word “this” in the phrase “this congestion score” refers to the previous clause. The previous clause, which is taken directly from the ’745 Patent abstract (8 A-56) and the specification (8 A-65 at 4:12-18), in fact shows that the examiner is using the term “congestion score” just as it is used in the definition in column 8 of the ’745 Patent– a ratio of routing resources used so far (“consumption of routing resources”) to the routing resources available in the bucket (“routing space available on the bucket”). This provides no support for Magma’s made-up definition of the term “congestion score.”

In sum, the clear, express definitions of “bucket” and “congestion score” that the patentees wrote in the specification control the construction of the terms, and those definitions trump other arguments Magma has attempted to make in support of a different and broader claim construction.

### **III. THE ‘116 PATENT.**

Synopsys is proposing to define the phrase “generating said physical design” as “producing an improved physical design.” This is the definition that is required by the specification and is fully supported by the intrinsic evidence. Magma proposes to give the jury no help at all with this claim term, arguing that the jury should simply read the words on the paper and do their best to understand – that is what Magma means when it advocates the alleged “plain meaning” of the term. More important, it will be unclear to the jury that the key idea of



*improving* the design is a necessary part of the term if Magma prevails in avoiding a construction of the term.

**A. Improving The Design Should Be Explicit In The Construction Because It Is Part Of Every Disclosed Embodiment And It Is Necessary For The Patent To Be Useful.**

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To understand a patent claim, it is necessary to look at the intrinsic record in the specification. The claims of a patent “are directed to the invention that is described in the specification; they do not have meaning removed from the context from which they arose.” Netword, LLC v. Centraal Corp., 242 F.3d 1347, 1352 (Fed. Cir. 2001) (holding that limitations not explicitly recited in claim 1 were nevertheless inherent in it because the claims cannot “enlarge what is patented beyond what the inventor has described as the invention”).

In the ‘116 Patent specification, every embodiment of “generating said physical design” involves producing an improved physical design. For example, the specification states that the alleged invention “will be able to generate solutions to overcome the problems present in the prior integrated circuit.” See 19 A-252 at 9:27-30. Generating design solutions that are improvements over the previous designs are disclosed throughout the specification, as detailed in Synopsys’ Opening Brief. D.I. 146 at 32-33. That is the only type of generation of design that is disclosed. In addition, the preambles of claims 1 and 15, which provide the antecedent basis for the term “said physical design,” say that the claim is “a method of *improving* a physical design.”

If the specification of a patent discloses only one embodiment of a term, the court is required to limit the term to the disclosed embodiment, regardless of the ordinary meaning of the term. See Wang Labs., Inc. v. America Online, Inc., 197 F.3d 1377, 1383 (Fed. Cir. 1999) (“[t]he only embodiment described in the ’669 patent specification is the character-based protocol, and the claims were correctly interpreted as limited thereto”). Because every

embodiment of “generating said physical design” disclosed in the ‘116 Patent involves producing an improved design, the meaning of the term should be interpreted accordingly. See also Toro Co. v. White Consol. Indus., Inc., 199 F.3d 1295, 1301-02 (Fed. Cir. 1999) (a claim term is limited to the only embodiment disclosed in the specification).

In addition, for the claims to have usefulness under 35 U.S.C. § 101, they must contain the limitation of improving a previous design. In fact, the parties agree that claims 1 and 15 require some reference to improving a physical design. Magma’s brief repeatedly emphasizes that the purpose of claims 1 and 15 is to produce a physical design that is improved over that of a prior integrated circuit. D.I. 145 at 7-10. Magma itself points out that the preambles of the claims – which explicitly refer to improving a physical design – “must be read as part of independent claims 1 and 15.” Id. at 9. The only real difference in the parties’ positions is that Magma, as stated in its opening brief, believes the claim should refer to attempted improvements, rather than actual improvement.

Although Magma insists that claims 1 and 15 relate to attempting to improve a physical design, Magma proposes a construction – “plain meaning” – that provides no guidance on this very feature. This raises the real possibility of jury confusion, because if the jury does not understand that claims 1 and 15 involve improving a physical design, they may mistakenly think that the claims cover generation of any physical design based on any physical design information, not an improvement over a previous physical design. Magma’s alleged “plain meaning” construction will create such confusion because it contains no reference to improving a physical design or even attempting to improve a physical design – the very limitation Magma argues the claims should include. In contrast, Synopsys’ construction avoids confusing the jury because it clearly recites “an improved physical design.”

**B. Magma's Proposed Construction Is So Uncertain That It Violates The Notice Function Of The Claims.**

For the same reasons, Magma's alleged "plain meaning" construction also violates the notice function of the claims. See Vitronics, 90 F.3d at 1583 ("competitors are entitled to review the public record, apply the established rules of claim construction, ascertain the scope of the patentee's claimed invention"). In its Opening Brief, Magma argues that the claim requires at least an attempt to improve the design. Magma talks about a "goal" or "aspiration" of improving the design, saying that the circuit "is more likely to be optimized" sometimes and "less likely to be optimized" at other times. D.I. 145 at 9. But this does not appear in Magma's "plain meaning" construction. Indeed, even if it did, the public would never know whether something infringed the claim based on the shifting sands of Magma's interpretation. Magma's construction, as set out in its brief, is so uncertain that fails to satisfy the notice function of the claims.

**C. The Preambles Of Claims 1 And 15 Are Positive Limitations On The Claims.**

Based on recent meet-and-confer discussions, Synopsys believes that Magma, in its Answering Claim Construction Brief, may raise the issue whether the preambles of claims 1 and 15 are limitations on the claims. Although Synopsys does not believe it is necessary for the Court to decide this issue in order to correctly construe the "generating said physical design" element, the preambles provide further support for Synopsys' construction.

The preambles of claims 1 and 15 are limitations on the claims. In fact, Magma's own statements in its Opening Brief show that these limitations are important to the alleged invention. As discussed above, Magma contends in its brief that the preambles of claims 1 and 15 "must be read as part of independent claims 1 and 15." D.I. 145 at 9. Synopsys agrees. The

preamble of a claim should be considered as part of the body of the claim if it is “necessary to give life, meaning, and vitality” to the claim. Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1305 (Fed. Cir. 1999). In particular, where – as here – the preamble provides the only antecedent basis for elements appearing in the body of the claim, “it is essential that the court charged with claim construction construe the preamble and the remainder of the claim . . . as one unified and internally consistent recitation of the claimed invention.” Id. at 1306; see also Bell Comm’n Research, Inc. v. Vitalink Comm’ns Corp., 55 F.3d 615, 620-21 (Fed. Cir. 1995) (“These two steps of the claimed method, by referring to ‘*said* packet,’ expressly incorporate by reference the preamble phrase “said packet including a source address and a destination address”). In claims 1 and 15 of the ‘116 Patent, the only antecedent bases for the limitations “said current integrated circuit” and “said physical design” are in the preamble. Thus, these claims have no life or meaning without the preamble, and the preamble must be considered part of the definition of the claimed invention.

In any event, the preamble is always part of the intrinsic evidence, and this preamble shows that Synopsys’ proposal for construing the “generating said physical design” element – that the physical design generated is an improvement over a prior physical design – is both correct and helpful to the jury.

### **CONCLUSION**

For the reasons described above and in Synopsys’ Opening Claim Construction Brief, Synopsys respectfully requests that the Court adopt the constructions proffered by Synopsys for the disputed claim terms discussed above.

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November 17, 2006

**CERTIFICATE OF SERVICE**

I hereby certify that on November 17, 2006 I electronically filed the foregoing with the Clerk of the Court using CM/ECF, which will send notification of such filing to William J. Marsden, Jr.

I further certify that I caused to be served copies of the foregoing document on November 17, 2006 upon the following in the manner indicated:

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